

Entwicklung und Demonstration einer Technologie zur nachhaltigen Trinkwassergewinnung aus Luftfeuchtigkeit - WaLu

Förderkennzeichen: UT 180

In the past few years, the exhaustive consumption of water as well as climate change have caused a shortage of natural drinking water resources in many regions of the world. Particularly in the arid and semi-arid areas, drinking water abstraction is an existential issue. Since, in these areas, potential evaporation exceeds precipitations, sustainable water abstraction from surface waters or groundwater sources is not possible. Water extraction from air would be a technological option for solving that problem but presently, there are no such satisfactory approaches available on the market. The project intends to implement an altogether novel commercial-scale method enabling the efficient generation of drinking water from atmospheric humidity by means of combined absorption/desorption i.e., by combining the absorption of atmospheric humidity on a liquid absorbent with desorption by means of an innovative vacuum evaporation technique. Within the development project, an energy self-sufficient mobile facility for decentralized water extraction from air will be manufactured and tested. The facility's performance will be demonstrated. The hygroscopic liquid used as absorbent absorbs water from the air through intense contact with the latter. By heating with solar heat and employment of a multi-stage vacuum evaporator, the water is intended to be energy-efficiently extracted from the liquid and may then be conditioned with minerals to be used as drinking water. Since power will be supplied by photovoltaics, too, the new facility will be suited for use in areas without energy infrastructure. Besides, the facility does not produce any waste and all working media are being cycled. Using renewable energies, the entire method thus is sustainable and CO₂-neutral.